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Understanding the Effect of Digital Literacy on Employees' Digital Workplace Continuance Intentions and Individual Performance

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ABSTRACT

While a growing body of literature suggests that employees' digital skills are important to enable both individuals and organisations to make the most of the digital workplace, empirical understanding of their effect on technology adoption and performance is currently limited. Drawing on prior models of technology acceptance and continuance, the present study investigated the effect of digital literacy on behavioural intention to continue using the digital workplace and, ultimately, on individual performance. Linear regression was used to analyse the conceptual model using survey data from 142 employees of a major UK charitable organisation. Results partially supported the model, demonstrating that employees' digital skills effect continuance intentions and individual performance via their perceptions of ease of use. The findings suggest an important role for digital literacy, both as an antecedent to the more general determinants of technology adoption, and in organisational interventions designed to encourage digital workplace adoption.

KEYWORDS

Continuance Intentions, Digital Literacy, Digital Workplace, Individual Performance, Technology Acceptance

INTRODUCTION

Digital technologies (such as productivity suites, mobile devices, and collaboration platforms) are now an integral part of most workplaces (Cascio & Montealegre, 2016). Implementing such technologies, however, does not guarantee their success (Schallenmueller, 2016), it is essential that individuals adopt and use them as intended for benefits to be realised (Venkatesh et al., 2003). The digital literacy of the workforce can contribute to this outcome (Mohammadyari and Singh, 2015). While a growing body of literature suggests that employees' digital skills are important to enable both individuals and organisations to make the most of the digital workplace, empirical understanding of their effect on technology adoption and performance is currently limited.

The present study investigates the effect of digital literacy on behavioural intention to continue using the digital workplace and, ultimately, on individual performance. Data was gathered from the workforce of a major UK charitable organisation. A new conceptual model was developed (see Figure 1) and the pathways within it assessed. It takes as its base model the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), adapting it using measures of information systems (IS) continuance intention and individual performance (Bhattacherjee, 2001), as well as including digital literacy (Van Deursen, Helsper and Eynon, 2016) as a new antecedent.

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Findings have the potential to advance current understanding of technology acceptance in the workplace. Greater understanding of the relationship between digital literacy and digital workplace acceptance may also have important implications for organisations and the design of interventions to help employees make optimal use of digital tools at work.

BACKGROUND

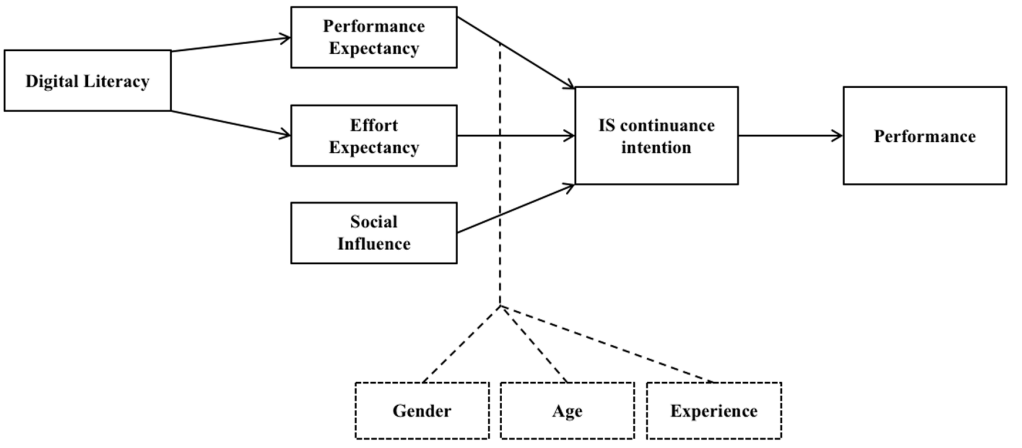
Prior Research on the Digital Workplace

The workplace, and the way that we work within it, has been fundamentally reshaped by technology in the last 30 years, a process that is continuing and gathering pace (Cascio, 2014; Cascio and Montealegre, 2016). The growing consumerisation of technology has seen the migration of new capabilities, such as social platforms and mobile devices, from the consumer market into the workplace (Harris, Ives and Junglas, 2012; Loose, Weeger and Gewald, 2013). In his seminal 2006 paper, McAfee coined the term 'Enterprise 2.0' to describe the new wave of social and collaborative technology inside of organisations, pointing out their potential to better facilitate knowledge work where legacy knowledge management systems had largely failed. Writing a decade on from McAfee's paper, Schallenmueller (2016) notes the deep impact that such technologies, as part of an extended range of information technology capabilities in enterprises, have had on the workplace. Mobile, big data, cloud computing and search-based applications have been, and continue to be, particularly significant in this respect (White, 2012).

While the term 'digital workplace' has been in use since around the turn of the century (e.g. Beir, 2000; Benson, Johnson and Kuchinke, 2002) it has become increasingly popular in a business context in the 2010s as a way of describing the broad set of connected technologies that employees use on a daily basis to do their jobs. This is evidenced, for example, by Gartner's publication of an inaugural 'Hype Cycle for Digital Workplace' (Cain, Austin and Gotta, 2014), as well as the launch of specific digital workplace offerings by major consultancies (e.g. Avanade, 2014; Deloitte, 2014,).

The digital workplace is an integrative concept that reaches across enterprise tools and, in one definition, has been described as: "The aggregated set of technology services that enable us to do our work, including: intranets, unified communication, microblogging, HR systems, email, mobile applications, collaborative spaces, supply chain and customer relationship management systems."

Figure 1. Conceptual Model



(Miller and Marsh 2014 as quoted in Wiggins, 2015, p. 607). Among these technologies, the intranet is sometimes viewed as a "precursor to" (White, 2012, p. 208), "front door to" (McConnell 2011), or "core component of" (Miller and Marsh, 2014, p. 78) the digital workplace, descriptions which highlight its potential to act as an integration point for all of the digital tools that employees' need.

Dery, Sebastian and Van der Meulen (2017) take a different approach to describing the digital workplace, highlighting its relation to the digital, physical and cultural aspects of designing work in complex, dynamic organisations that help to streamline the way in which work happens. This speaks to the need to focus not only on the technologies of the emerging digital workplace, but also to fundamentally redesign work for the digital age (Colbert, Yee and George, 2016), enable advances in the people, collaborative and contextual aspects of knowledge management (Hobert, 2015), develop a culture that is conducive to digital work (Oxford Economics, 2017), and help employees develop the new behaviours and competencies that working in such a way demands of them (Kiron et al., 2016).

Organisations are making large investments in digital workplace technologies, as indicated by the anticipated market size of digital workplace transformation which, in one estimate, is expected to grow to USD 18.06 billion by 2021 (Markets and Markets, 2017). Expected benefits resulting from such investments include: employee productivity and satisfaction, talent attraction, accelerated innovation and increased revenue (Avanade, 2014; Deloitte, 2014). However, simply installing the technology is not enough to guarantee that such technologies will be successful (Schallenmueller, 2016), as the mixed results of technology implementations in the field of knowledge management have demonstrated (e.g. Schmidl et al., 2011, Coakes, Amar and Granados, 2013). Organisations need to invest not only in the technologies, but also in the people and skills that enable the workforce to use them optimally (Oxford Economics 2017), thereby enabling 'digital dexterity', or the ability for the organisation as a whole to move swiftly to exploit new digital opportunities (Soule et al., 2016).

In a literature review of digital workplace research, Köffer (2015) notes that there is, as yet, no particular academic research stream for the digital workplace as an integrated concept, although the associated technologies have received extensive attention individually. The recent publication of an edited book 'The New Digital Workplace: How New Technologies Revolutionise Work' (Marks et al. 2017) may signal that academic interest in this field is growing and that such a dedicated research stream is indeed now emerging. In addition, Cascio and Montealgre (2016) underline the importance, for occupational psychologists in particular, of investigating and understanding how technology is impacting on work and organisations.

Prior Research on Technology Acceptance and Continuance

Information systems research reaches back to the 1950s and covers a range of issues such as decision support, human-computer interaction and the value of information (Banker and Kauffman, 2004). Relatively early on in its development, user acceptance of technology was identified as one of its most challenging issues (Swanson, 1988, cited in Davis, Bagozzi and Warshaw, 1989, p. 982) and is today considered one of its most mature research streams (Venkatesh, Davis and Morris, 2007). It focuses on users' willingness, or lack thereof, to use information technology in the way it is intended in order to enable tasks (Dillon and Morris, 1996). Insights from this research stream are important for organisations as expected benefits from technology investments may not be realised if such systems are not adopted by users (Sharma and Mishra, 2014).

As early as the 1970s, researchers seeking to understand acceptance behaviour among technology users recognised the need to go beyond the technology itself to gain an understanding of user attitudes and perceptions towards it (Banker and Kauffman, 2004). Drawing on psychological theories such as the Theory of Reasoned Action (Ajzen and Fishbein, 1975), Self-Efficacy Theory (Bandura, 1982), the Theory of Interpersonal Behaviour (Triandis, 1977), and the Theory of Planned Behaviour (Ajzen, 1985), a range of models have been developed to understand user acceptance. These approaches seek to predict technology usage by focusing on the human decision-making processes that cause a user to either accept or resist a new technology (Dillon and Morris, 1996).

The proliferation of technology acceptance models led Venkatesh and colleagues (2003) to propose a new, unified view of user acceptance using Ajzen's (1985) Theory of Planned Behaviour as their conceptual framework. They integrated elements from eight prominent models, the most robust and widely used of these being the Technology Adoption Model (TAM; Davis, 1989) which predicts behavioural intention based on the constructs of perceived usefulness and perceived ease of use (Sharma and Mishra, 2014).

The resulting Unified Theory of Acceptance and Use of Technology (UTAUT), for which the authors found strong empirical support, incorporates three direct determinants of intention to use technology (performance expectancy, effort expectancy, and social influence) and two direct determinants of usage behaviour (intention and facilitating conditions). Effort expectancy and performance expectancy have been defined respectively as the extent to which an individual believes that system use will be easy and lead to job performance gains (Venkatesh et al., 2003, pp. 447-450). Both constructs build on those used in the original TAM. The other determinant of intention to use technology, social influence, draws on a later extension of the TAM (Venkatesh and Davis, 2000) and relates to an individual's perception of whether important others believe he or she should engage with and use the system.

The researchers also identified that experience, voluntariness of use, gender and age were significant moderating factors, although as they themselves acknowledged, gender and age may have less impact as a younger cohort of employees progressively enters the workplace. Venkatesh, Thong and Xu (2016) express disappointment that so few UTAUT studies have included these moderating factors as this weakens the ability to understand the generalizability of the model.

The extensive UTAUT literature that has developed in the last 15 years has not only replicated the model but also sought to extend it, both through using it in conjunction with other theories and models, and also by exploring the potential antecedents of its general determinants (Venkatesh, Thong and Xu, 2016). Chan et al. (2011) suggest that such extensions offer a valuable way of applying the model in different contexts as well as helping to identify interventions that will increase acceptance within them.

One of the reasons that the UTAUT has been used in conjunction with other theories is to understand technology use beyond initial acceptance (Venkatesh, Thong and Xu, 2016). A number of studies (e.g. Miltgen, Popovi and Oliveira, 2013; Sun et al., 2014) have taken this approach using, for example, Rogers' (1962) Diffusion of Innovations theory to understand how technology spreads throughout the user population, and Bhattacherjee's (2001) IS Continuance Model to understand users' intentions to continue using technology over time.

A review by Venkatesh, Thong and Xu (2016) highlights the range of technologies and contexts in which the UTAUT has been used, including: citizens' use of e-government services (Chan et al., 2014), physicians' use of digital systems in a hospital (Chang et al., 2007), customers' use of mobile banking (Oliveira et al. 2014), and employees' use of an e-learning system in the workplace (Sarabadani, Jafarzadeh and ShamiZanjani, 2017). It is interesting to note that although none of the studies they highlight specifically explore the digital workplace as an integrative concept, the UTAUT has been used to investigate some of its component technologies. These include: workplace e-learning (Yoo, Han and Huang, 2012), Enterprise 2.0 applications (Wang et al. 2014), desktop applications (Al-Gahtani, Hubona and Wang, 2007), a knowledge management system (Bourdon and Ollet-Haudebert, 2009), and BYOD ('Bring Your Own Device'; Loose, Weeger and Gewald, 2013).

UTAUT studies have also investigated a range of antecedents to the general determinants of behavioural intention to use technology (Venkatesh, Thong and Xu, 2016). These include: computer self-efficacy (Chiu and Wang, 2008), organisational culture (Ciganek, Mao and Srite, 2010), perceived threats (Loose, Weeger and Gewald, 2013), intrinsic motivation (Yoo, Han and Huang, 2012), and perceived innovativeness with IT (Wang et al., 2014). The inclusion of digital literacy as an antecedent to the general determinants represents a novel extension of the UTAUT (Mohammadyari and Singh, 2015).

In their UTAUT study of e-learning technology, Mohammadyari and Singh (2015) use the model in conjunction with the IS Continuance Model (Bhattacherjee, 2001) as well as extending it by including a measure of digital literacy (Hargittai, 2005). The authors found that digital literacy had a direct positive impact on both effort expectancy and performance expectancy, and the latter significantly impacted on continuance intentions and individual performance. Based on their findings, the authors argue that digital literacy facilitates e-learning use and its ultimate impact on individual performance, validating the significant investments that many organisations are making in this technology.

Prior Research on Digital Literacy

The term 'digital literacy' was first used in the 1990s (e.g. Gilster, 1997; Lanham, 1995), although work to extend the notion of 'literacy' for an increasingly technological age stretches back to the 1960s (Belshaw, 2011). In the intervening years, visual literacy, computer literacy, and information literacy attracted a great deal of research interest and a substantial body of literature had developed by the time the concept of digital literacy was introduced (Chinien and Boutien, 2011; Martin and Grudziecki, 2006). In the present, research on digital literacy sits alongside and sometimes overlaps with that on new media literacy, e-literacy, e-skills, digital skills, ICT literacy, digital competence, technological literacy and information literacy (Chinien and Boutien, 2011; Covello, 2010; Van Laar et al., 2017) meaning that this is far from being a simple or unitary field (Belshaw, 2011).

An early conceptualisation of digital literacy by Gilster (1997, p. 17) as "being about ideas, not keystrokes" remains popular and relevant to the present, perhaps because it implies a much broader set of skills than just being able to operate a computer (Eshet, 2012). Underlining the breadth of the concept, Gilster (1997, p. 33) further elaborated his definition of digital literacy as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers.". Reflecting on this early definition nearly a decade later, Bawden (2008) points out that digital literacy continues to be an integrative concept that relates to an extended range of skills and abilities.

Indeed, some researchers argue that it is more appropriate to talk about 'digital literacies' in the plural in order to encompass the wide range of skills, competencies and practices involved (e.g. Jones and Hafner, 2012; Lankshear and Knobel, 2008). For others, digital literacy is, itself, just one dimension of the wider concept of new or twenty-first century literacies or multiliteracies that aim to cover an all-encompassing set of practices related to living in a global, technological society (e.g. Leu et al., 2009). The digital literacy concept is likely to remain fluid as technologies continue to change (Chinien and Boutien, 2011), indeed Covello (2010) remarks on how much it has already changed with the emergence of Web 2.0 (i.e. the social, collaborative web).

Given the multiplicity of definitions of digital literacy, accounts and models also abound (Belshaw, 2011). These tend to range in breadth from a relatively narrow focus on technical skills and competencies ("mastering keystrokes" in Gilster's phrase) through to a broad focus on ideas, social practices and mind-sets (Gilster's "mastering ideas"). Martin and Grudziecki (2006, p. 255), defining digital literacy as part of the DigEULit project, encapsulate the latter view:

Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.

The definition is underpinned by a layered model which depicts technology users as advancing through three stages: digital competence (in which a range of skills are gained), digital usage (in which these skills are used in an applied setting), and finally digital transformation (in which the application of skills leads to innovation and creativity).

Later work emanating from the European Commission, known as DIGCOMP, further elucidates the components of digital competence and shows how it applies in different contexts such as leisure, education, society and work (Kluzer and Pujol Priego, 2018), thus demonstrating the important point that digital literacies can only really be understood when contextually situated (Lankshear and Knobel, 2008). DIGCOMP takes a broad view, going beyond device or software use to encompass the use of digital technology in a critical, collaborative and creative way. As such it identifies twenty-one competences (e.g. managing digital identity, protecting health and well-being, identifying digital competence gaps) that are organised into five areas (information and data literacy, communication and collaboration, digital content creation, safety, and problem solving) and assessed across eight levels of proficiency.

Eshet (2004, 2012), also taking a broad view of digital literacy, provides a skills-based theoretical framework to understand the wide and complex range of abilities that it involves. In a 2012 revision to his original model, Eshet sets out six skills that he argues constitute digital literacy: photo-visual, reproduction, branching, information, socio-emotional and real-time digital skills. This is a view that acknowledges that digital literacy involves a complex range of cognitive, technical and social-emotional skills, a view set out in detail by Ng (2012a), who emphasizes critical literacy (i.e. evaluating motivations behind content) as being at the centre of all these skills.

Although theoretical research into digital literacy is abundant, many of the available assessments are inadequate, focusing too narrowly on technical skills (Calvani et al., 2008). Covello (2010), in a review of digital literacy assessment instruments, points out that the fragmented nature of digital literacy research as well as its overlap with other related domains make it difficult to select a suitable instrument. He argues that an understanding of the underlying definition and concept, as well as how it is evolving based on new technologies, is essential to making such a selection. This is particularly important as instruments may be labelled with a number of related terms such as ICT literacy (Martin and Grudziecki, 2006), digital competence (Calvani, Fini and Ranieri, 2009), and internet skills (Van Deursen, Helsper and Eynon, 2016).

In developing a new measurement tool for digital literacy, Van Deursen, Helsper and Eynon (2016) acknowledge a number of shortcomings of previous measures (e.g. Hargittai, 2005; Van Deursen, Van Dijk and Peters, 2012) such as only focusing on technical skills and not reflecting recent changes to technology (e.g. social and mobile developments). The authors propose a new measure, the Internet Skills Scale (ISS), which is based on a broad conceptualization of digital literacy that goes beyond just technical competencies to encompass social, critical and creative skills.

Their framework consists of five types of internet skills: operational, information navigation, social, creative and mobile. It is specifically designed, according to the authors, to retain relevancy as new and novel platforms and applications appear, although they acknowledge that the scale will need further development in areas such as information seeking and mobile skills as technologies continue to evolve. Van Deursen, Helsper and Eynon (2016) argue that the skills covered in their measure are a prerequisite for engagement with digital technologies and Van Laar et al. (2017), building on their work, argue that they are essential for people to be successful in the workplace.

Digital skills have been highlighted among the elements required for employees to operate effectively in the digital workplace (Briggs and Makice, 2012; Kiron et al., 2016; Soule et al., 2016), with employees potentially losing nearly 8 percent of productive time due to poor IT resources or inadequate digital skills (Van Deursen and Van Dijk, 2012). A high level of digital literacy, on the other hand, can help to reduce cognitive load for individuals when using technology, thereby freeing them to focus on the task at hand (Ng, 2012b). It can also enable them to quickly and conveniently access information, collaborate with others, and share knowledge (Kasemsap, 2018).

In addition, digital skills can aid inclusion and well-being in the workplace (Collard et al., 2017) as well as the management of social relationships and identities in a virtual workplace (Jones and Hafner 2012). In fact, digital literacy is seen as essential for the modern workforce (Briggs and

Makice, 2012) and is thought to be one of the top ten workplace skills for future organisations (Senter and McClelland 2015).

A lack of such skills among the workforce can reduce the organisation's ability to benefit from digital workplace technologies and participate fully in the knowledge economy (Jones and Hafner, 2012; Kiron et al., 2016; Mitrovic, 2010). The House of Commons (2016) reports that almost 50 percent of UK employers have a digital skills gap in their business and that this gap is costing the UK economy an estimated GBP 63 billion a year in lost additional GDP.

Despite evidence of the importance of digital skills at both an organisational and individual level for positive digital workplace outcomes, there is a lack of empirical studies investigating the digital skills needed by the workforce as a whole (rather than just ICT specialists) potentially compromising organisations' adaptive capacity in the face of fast evolving technologies (Chinien and Boutien, 2011). In addition, there is limited research examining the impact of digital skills on technology acceptance and continuance (Mohammadyari and Singh, 2015).

MAIN FOCUS OF THE ARTICLE

A substantial body of literature has demonstrated that users' attitudes and perceptions towards a technology significantly impact on their behavioural intentions to use it (e.g. Venkatesh, Thong and Xu, 2016). This literature has explored a range of antecedents to the general determinants in the UTAUT model, however research on the impact of digital literacy on technology acceptance and continuance is as yet immature. The literature has also explored acceptance for a range of different technologies, however this does not yet encompass the digital workplace as an integrative concept. In addition, the digital workplace research stream itself is emergent, with only a small body of dedicated literature to date.

A new conceptual model was developed (see Figure 1) and the pathways within it assessed. Given that prior research has indicated the potential importance of digital literacy for effective adoption and use of technology, it is expected that similar associations will be found in the current sample. It is anticipated that digital literacy will be positively associated with higher performance expectancy and effort expectancy, and that these measures will in turn be positively associated with users' continuance intentions and individual performance. Social influence is also expected to be positively linked to continuance intentions as per prior studies. Prior research on technology acceptance has also suggested that the control variables of age, gender and experience may mediate these associations, and it is therefore expected that such effects may be identified in the present study. In summary, the research hypotheses are:

- Digital literacy will be positively associated with both higher performance expectancy and higher effort expectancy.
- Performance expectancy, effort expectancy and social influence will be positively associated with users' digital workplace continuance intentions.
- Users' digital workplace continuance intentions will be positively associated with individual performance.
- The control variables of age, gender and experience will mediate the hypothesised associations.

METHOD

Participants and Procedure

Participants for this study (N = 142) were recruited using opportunity sampling from among the employees of a major UK charitable organisation headquartered in London. 119 females (83.8 per

cent) and 23 males (16.2 per cent) participated in the study. Their ages ranged from 22 to 68 years (M=38.36, SD=11.15) and their length of tenure ranged from 1 to 32 years (M=5.33, SD=6.57).

The study was reviewed by the School of Psychological, Social and Behavioural Sciences, and approved by the University Research Ethics Committee at Coventry University. A gatekeeper email was sent, and approval given, in order to gain access to participants in the organisation. Employees at the organisation were invited to complete an online survey (run using Bristol Online Surveys) available via its intranet. Participation was on a voluntary basis and the survey took around 10 minutes to complete. Participants were provided with a Participant Information Sheet prior to completing a Survey Consent Statement and commencing the survey, as well as a Debrief page immediately following completion. A paper version of the survey was also prepared but not used as sufficient responses were forthcoming via the online method.

Measures

Participants completed a questionnaire with items relating to digital literacy, the determinants of behavioural intention to use technology, continuance intention, and individual performance. The technology under investigation was the intranet as the "front door" (McConnell, 2011) to the organisation's evolving digital workplace. In addition, participants responded to questions about their age (in years), gender, and length of tenure (in years). Voluntariness of use was not measured as use of the technology in question was mandated for all employees. Descriptive statistics for all core measures in this study are presented in Table 1 in the Results section.

Digital Literacy

Participants' digital literacy was measured using the Internet Skills Scale (ISS; Van Deursen, Helsper and Eynon, 2016). The scale comprises 23 items assessing five types of internet skills: operational (e.g. 'I know how to open downloaded files'), information navigation (e.g. 'I find it hard to find a website I visited before'), social (e.g. 'I know which information I should and shouldn't share online'), creative (e.g. 'I know how to create something new from existing online images, music or video'), and mobile (e.g. 'I know how to install apps on a mobile device'). A Likert scale was used for the response format, with respondents requested to rate their skills for each item on a scale of 1 (not at all true of me) to 5 (very true of me). 5 items required reverse scoring. While both short and long versions of the ISS are available, the short version was deemed suitable for the present study as no analysis of the individual types of internet skills was involved. Van Deursen, Helsper and Eynon's (2016) study suggests that the ISS framework is a reliable measure (CR > .70) with a robust theoretical foundation. In the present study, the Cronbach's alpha was .86.

Determinants of Behavioural Intention to Use Technology

Determinants of participants' behavioural intention were measured using a number of constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003). 12 scale items from the UTAUT were included in the questionnaire to assess the three direct determinants of behavioural intention: performance expectancy (e.g. 'I find the intranet useful in doing my job'), effort expectancy (e.g. 'I find the intranet easy to use'), and social influence (e.g. 'People who influence my behavior think that I should use the intranet'). A Likert scale was used for the response format, with respondents requested to rate each item on a scale of 1 (strongly disagree) to 5 (strongly agree). Minor wording changes were made in order to (a) replace the generic word 'system' with 'intranet', and (b) modify the tense of the statements to reflect that the system being studied is already in use (e.g. 'I find the intranet easy to use' instead of 'I would find the intranet easy to use'). Venkatesh et al. (2003) found that reliability across all elements in the UTAUT was acceptable (CR > .70). In the present study, the Cronbach's alpha for the determinants used was .88.

IS Continuance Intention and Individual Performance

Participants' intentions to continue using the intranet and anticipated individual performance as a result of doing so were measured using constructs from Bhattacherjee's (2001) Information Systems Continuance model (ISCM). 7 scale items from the ISCM were included in the questionnaire to assess IS continuance intention (e.g. 'If I could, I would like to discontinue my use of the intranet') and Perceived Usefulness (e.g. 'Using the intranet improves my performance in doing my job'). A Likert scale was used for the response format, with respondents requested to rate each item on a scale of 1 (strongly disagree) to 5 (strongly agree). Minor wording changes were made to replace the generic word 'system' with 'intranet'. One item required reverse scoring. Bhattacherjee (2001) found that reliability across all elements of the ISCM was acceptable (CR > .80). In the present study, the Cronbach's alpha for the constructs used was .90.

RESULTS

The model was analysed in IBM SPSS Statistics (Version 24) using linear regression.

Descriptive Statistics

Table 1 shows means and standard deviations for all variables. It also shows skewness and kurtosis z-scores for the constructs. Mild violations of normality were found in some of them. As there were no compelling reasons not to transform the data (Tabachnick and Fidell, 2014) transformations were attempted and were found to be successful in the case of Digital Literacy and IS Continuance Intention. Following these transformations, all measures had skew and kurtosis z-scores within ±1.96 (Field, 2009) and standardised z-scores within ±3.29 (Tabachnick and Fidell, 2014). These indicators, along with visual exploration of the graphs (Field, 2009), suggested that the data were broadly normal and acceptable for parametric analyses.

Bivariate Correlation Analyses

The relationships between the variables were investigated using Pearson product-moment correlation coefficient following preliminary analyses to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Bivariate correlations between all variables are presented in Table 2.

Table 1. Summary statistics for modelled variables

	Mean	SD	Skewness (z-score)	Kurtosis (z-score)
Age	38.36	11.15	-	-
Gender	1.84	0.37	-	-
Tenure	5.33	6.57	-	-
Digital Literacy	93.80	11.80	-2.99	.39
Performance Expectancy	12.46	3.23	-.99	.39
Effort Expectancy	14.85	3.20	-1.91	1.05
Social Influence	11.72	2.89	-1.46	1.20
IS Continuance Intention	11.23	2.03	-3.84	4.55
Perceived Usefulness	12.82	3.81	-1.26	-1.12

Notes. Age and Tenure were measured in years. Digital Literacy was scored from 1 to 115; Performance Expectancy, Effort Expectancy, Social Influence and Perceived Usefulness were scored from 1 to 20; IS Continuance Intention was scored from 1 to 15; higher scores correspond to higher levels of the construct in all cases. Z-scores (prior to noted transformations) are presented for skewness and kurtosis.

Table 2. Bivariate correlations between modelled variables

	1	2	3	4	5	6	7	8
1. Age								
2. Gender	-.09							
3. Tenure	.45**	-.04						
4. DL	-.13	-.13	-.18*					
5. PE	-.06	.11	.11	-.01				
6. EE	-.19*	-.06	-.05	.32**	.48**			
7. SI	-.12	-.03	.01	-.05	.55**	.33**		
8. CI	-.18*	.09	.02	.03	.60**	.45**	.41**	
9. PU	-.02	.06	.04	-.04	.84**	.49**	.57**	.63**

Notes. DL Digital Literacy, *PE* Performance Expectancy, *EE* Effort Expectancy, *SI* Social Influence, *CI* IS Continuance Intention, *PU* Perceived Usefulness. * $p < .05$, ** $p < .001$.

The relationships between Digital Literacy (as measured by the ISS) and both Performance Expectancy and Effort Expectancy (as measured by the UTAUT) were investigated. There was a moderate, positive correlation between Digital Literacy and Effort Expectancy ($r = .32$, $n = 142$, $p < .001$) with high levels of digital literacy associated with high effort expectancy (i.e. a high degree of ease is associated with use of the intranet). There was no correlation found between Digital Literacy and Performance Expectancy ($r = -.01$, $n = 142$, $p = .90$).

The relationships between the determinants of behavioural intentions (Performance Expectancy, Effort Expectancy, and Social Influence; as measured by the UTAUT) and IS Continuance Intention (as measured by the ISCM) were investigated. There was a strong, positive correlation between Performance Expectancy and IS Continuance intention ($r = .60$, $n = 142$, $p < .001$). These results indicate that high levels of Performance Expectancy (i.e. using the intranet is expected to help improve job performance) are associated with high intentions to continue using the intranet. There was a moderate, positive correlation between Effort Expectancy and IS Continuance Intention ($r = .45$, $n = 142$, $p < .001$) and between Social Influence and Continuance Intention ($r = .41$, $n = 142$, $p < .001$).

The relationship between Continuance Intention and Perceived Usefulness (both as measured by the ISCM) was investigated. There was a strong, positive correlation between IS Continuance Intention and Perceived Usefulness ($r = .63$, $n = 142$, $p < .001$) with high intentions to continue using the intranet associated with higher expected performance.

Although there were weak, negative correlations between age and effort expectancy ($r = -.19$, $n = 142$, $p < .05$), as well as tenure and digital literacy ($r = -.18$, $n = 142$, $p < .05$), no other significant correlations were found between the control variables and constructs.

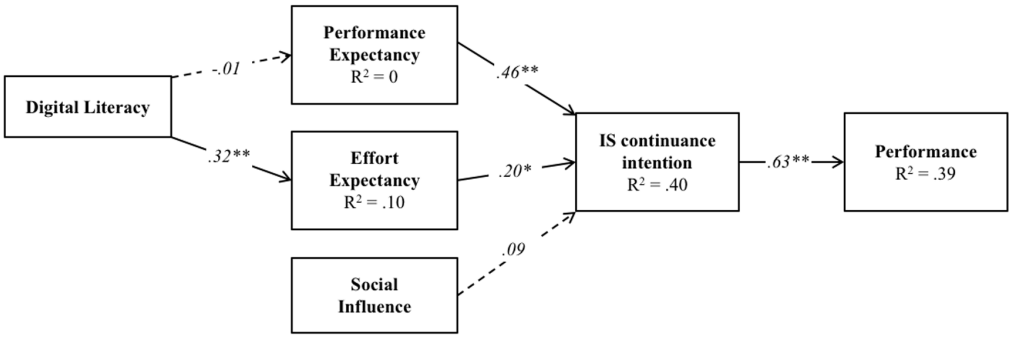
Given that correlations between the control variables (age, gender and experience) and the constructs were either non-significant or very small, they were excluded from the conceptual model with results from the linear regression analyses that is depicted in Figure 2.

Regression Analyses

Linear regression was used to explore the paths in the model. Results are presented in Figure 2. Preliminary analyses were conducted to ensure no violations of the assumptions of normality, linearity and homoscedasticity (as well as multicollinearity, in the case of the multiple regression analysis).

Simple linear regression analyses were used to assess the ability of Digital Literacy to predict users' levels of Performance Expectancy and Effort Expectancy when using the intranet. It was found that Digital Literacy made a statistically significant contribution to Effort Expectancy (beta

Figure 2. Linear regression results for the conceptual model. Notes. Non-significant paths are represented by dashed lines. * p < .05, ** p < .001



= .32, t(140) = 3.96, p < .001) explaining 10%, F (1, 140) = 15.65, p < .001), of the variance in the dependent variable. However, Digital Literacy did not make a statistically significant contribution to Performance Expectancy (beta = -.01, t(140) = .13, p = .90).

Multiple regression was used to assess the ability of the three determinants of behavioural intention (Performance Expectancy, Effort Expectancy, and Social Influence) to predict users' intentions to continue using the intranet as measured by IS Continuance Intention. The total variance in IS Continuance Intention explained by the model as a whole was 39.9%, F (3, 138) = 30.56, p < .001. Performance Expectancy (beta = .46, t(138) = 5.35, p < .001) and Effort Expectancy (beta = .20, t(138) = 2.62, p < .05) made statistically significant unique contributions to explaining IS Continuance Intention. Social Influence did not make a statistically significant contribution (beta = .09, t(138) = 1.14, p = .26).

Simple linear regression was used to assess the ability of Continuance Intention to predict users' expected performance (as measured by Perceived Usefulness) when using the Intranet. The total variance explained by the model was 39.1%, (F (1, 140) = 89.91, p < .001). Users' intention to continue using the intranet made a statistically significant contribution to Perceived Usefulness (beta = .63, t(140) = 9.48, p < .001).

DISCUSSION

Drawing on prior research on the digital workplace, technology acceptance, and digital literacy, the present study set out to investigate the relationships between digital literacy, digital workplace continuance intentions and individual performance. A conceptual model was developed, and pathways therein were tested using a series of linear regression analyses. The conceptual model, which was adapted from the UTAUT (Venkatesh et al., 2003), was partially supported. Findings revealed that digital literacy is positively associated with higher effort expectancy. However, no relationship was found between digital literacy and performance expectancy. Both performance expectancy and effort expectancy positively predicted behavioural intention to continue using the digital workplace. Social influence, however, was not found to be predictive of continuance intention. As expected, continuance intention positively predicted performance. Key findings are discussed below.

Employees' digital literacy was significantly positively associated with effort expectancy. In other words, higher levels of digital literacy mean that employees are more likely to perceive the intranet as easy to use. This supports the conceptual positioning of digital literacy as an element that can help employees to operate effectively in the digital workplace (e.g. Kiron et al., 2016). It is

likely that this occurred because digitally literate employees are better able to focus on tasks due to reduced cognitive load when using technology (Ng, 2012b), as well as easily and speedily carrying out common digital workplace tasks, such as accessing and sharing information (Kasemsap, 2018).

Despite indications in the literature (e.g. Kiron et al., 2016; Van Deursen and Van Dijk, 2012), no association between digital literacy and performance expectancy was found in the present study. In other words, employees' digital literacy did not impact on their perceptions of how useful the intranet would be to do their job, accomplish tasks, be productive, or get a raise. Mohammadyari and Singh (2015) found a significant positive association between digital literacy and performance expectancy, although it was considerably weaker than the association with effort expectancy. They highlight the relevance of Brown, Dennis and Venkatesh's (2010) study on collaboration technology use, in which the authors found that computer self-efficacy (i.e. individuals' beliefs about their ability to use technology effectively) was positively associated with effort but not performance expectancy. Insights from their study indicate a possible explanation for the lack of association between digital literacy and performance expectancy in the present one: as with the collaboration technologies they investigate, intranets are familiar, frequently-used tools inside most organisations and therefore additional digital skills may not significantly add to their usefulness for employees accessing them regularly to perform repeated tasks.

Together, the amount of variance in behavioural intention predicted by the determinants (performance expectancy, effort expectancy and social influence) in the present study (40%) is very similar to that found by Dwivedi et al. (2011) in their meta-analysis of 43 UTAUT studies (39%). Both performance expectancy and effort expectancy were found to predict continuance intentions, a finding that is consistent with other comparable adaptions of the UTAUT (e.g. Sun et al., 2014). In light of the literature, it is unsurprising that employees who perceive the intranet as useful and easy to use are likely to want to continue using it. Performance expectancy had a stronger effect than effort expectancy on continuance intentions. Again, this is in line with prior studies in which performance expectancy was consistently found to be the strongest predictor of technology acceptance (e.g. Davis, Bagozzi and Warshaw, 1989). The weaker effect of effort expectancy on continuance intentions may also be explained by it being thought to be more salient in the initial stages of adoption (e.g. Venkatesh et al., 2003) when users may face a steep learning curve before they become comfortable with the system.

In a finding that was contrary to expectations, social influence was not found to make a significant unique contribution to continuance intention. This is inconsistent with the technology acceptance literature, particularly in a mandatory use setting (e.g. Venkatesh et al., 2003). This may have occurred because social influence is less salient in a continuance as opposed to initial adoption context. For instance, Venkatesh and Morris (2000) found that after three months using a new system, social influence no longer significantly affected participants' behavioural intentions to use the technology. It is possible that digital workplace continuance is more strongly related to the individual's usage experience (i.e. effort required and performance gains) than normative beliefs (Chan et al., 2010).

In line with Bhattacherjee's (2001) IS Continuance Theory, continuance intention was strongly predictive of individual performance. This finding indicates that employees who intend to continue using the intranet believe that it will improve their performance, increase their productivity and enhance their effectiveness in their job. As per Mohammadyari and Singh (2015) this finding legitimates the large investments that organisations are making in the digital workplace technologies.

Although previous studies (e.g. Venkatesh et al., 2003; Venkatesh and Morris, 2000) have found that age, gender and experience significantly affected behavioural intentions to use technology, this was not supported by the present study. A possible explanation is that, as a younger cohort of employees have entered the workplace, these demographic factors have become less salient, as anticipated by Venkatesh et al. (2003). It may also be due to the wide adoption of intranets in large organisations (Oliveira et al., 2014).

Overall, the present study validated some aspects of the UTAUT model as well as demonstrating the value of including digital literacy in studies of digital workplace adoption. It also contributed

new data to the emerging digital workplace research stream and associated need to investigate digital tools in the workplace as an integrative concept.

Practical Implications

Köffer (2015) suggests that practitioners may be able to gain valuable insights from the emerging academic literature on the digital workplace. The present study contributes to these insights by empirically testing the determinants of individuals' behavioural intentions towards using the digital workplace. It also investigated the role of digital literacy as an antecedent to these general determinants. The findings suggest that there is scope for organisations to consider employees' digital literacy as part of wider efforts to encourage effective use of digital tools at work. Supporting employees in improving their digital skills may help to reduce their cognitive load and enable them to more easily perform tasks when using the digital workplace (Kasemsap, 2018; Ng, 2012b). Soule et al. (2016) emphasize that such interventions are critical to support overall organisational digital dexterity across customer experience, operational efficiency, and workforce enablement. In addition, Kiron et al. (2016) suggest that a large proportion of employees expect their organization to help them gain digital skills for work.

Limitations and Future Directions

There are several limitations in the present study that need to be considered when interpreting the results and generalising them to different organisations. First, this study investigated the intranet as the "front door" to an evolving digital workplace, rather than a mature, fully integrated digital workplace (e.g. McConnell, 2011; Miller and Marsh, 2014). This may have implications for the generalisability of the findings to organisations with a higher level of digital dexterity (Soule et al., 2016). Second, the sample was relatively homogenous in terms of gender. This may limit the generalisability of the findings as males and females can exhibit different technology acceptance profiles (e.g. Venkatesh et al., 2003). Third, this study examined digital literacy using a measure of internet skills. Although this measure provided a broad view of the components of digital literacy, it may not cover all of the specific digital skills required in the workplace (e.g. Chinien and Boutien, 2011). Fourth, digital workplace continuance intentions and perceived performance were measured at a single point in time for this study. These measures provide indicators of future behaviour and outcomes but are not the same as measuring actual behaviour and performance in a longitudinal design (e.g. Bhattacherjee, 2001; Venkatesh et al., 2003). Fifth, although the model was able to explain a proportion of the variance in the core criterion variables of continuance intention (40%) and performance (39%), this does suggest that other important factors are involved that were not considered by the present study. Finally, the present analysis, although appropriate in assessing the pathways within the model, was not able to assess model fit.

Several directions for future research are suggested by the findings, implications and limitations of the present study. Future research that investigates digital workplace adoption could be enriched by considering organisations with different levels of digital dexterity (e.g. Soule et al., 2016), actual adoption and performance data, as well as multiple time points in the technology acceptance journey (e.g. Bhattacherjee, 2001; Venkatesh et al., 2003). The conceptual model was based on the UTAUT and some of its pathways were supported by the findings. There may be other adoption models such as Venkatesh, Thong and Xu's (2016) multi-level framework of technology acceptance and use, that could furnish future digital workplace adoption studies with potentially valuable constructs and pathways for further exploration. Such studies could benefit from a digital literacy measure that is specifically designed for the workplace, something on which Chinien and Boutien (2011) and Van Laar et al. (2016) provide useful background insight.

CONCLUSION

The aim of this study was to investigate the relationships between digital literacy, digital workplace continuance and individual performance using data gathered from the workforce of a major UK charitable organisation. It took as its base model the UTAUT and adapted it using measures of digital literacy and continuance intention. Findings partially supported the conceptual model. The results demonstrated the influence of digital literacy on employees' effort expectancy, which in turn influenced their digital workplace continuance intentions and ultimately individual performance. Several findings differed from prior research. In particular, digital literacy was not associated with performance expectancy. The most important implication of this study is to suggest an important role for digital literacy both as an antecedent to the more general determinants of technology adoption, and in organisational interventions designed to encourage digital workplace adoption. For organisations investing in digital workplace technologies, consideration should be given to how such interventions can support employees in gaining and applying digital skills to their day-to-day tasks. Findings from the present study suggest avenues for future research into the nature of digital literacy at work and its association with digital workplace adoption and use.

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REFERENCES

Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In J. Kuhl & J. Beckman (Eds.), *Action Control* (pp. 11–39). Berlin, Germany: Springer. doi:10.1007/978-3-642-69746-3_2

Ajzen, I., & Fishbein, M. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. London, UK: Addison-Wesley.

Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). Information Technology (IT) in Saudi Arabia: Culture and the Acceptance and use of IT. *Information & Management*, *44*(8), 681–691. doi:10.1016/j.im.2007.09.002

Avanade. (2014). *Tailor. Engage. Empower. Work Faster in the Digital Workplace*. Retrieved from https://www.avanade.com/~/media/asset/ebook/avanade-digital-workplace-approach-ebook.pdf

Bandura, A. (1982). Self-Efficacy Mechanism in Human Agency. *The American Psychologist*, *37*(2), 122–147. doi:10.1037/0003-066X.37.2.122

Banker, R. D., & Kauffman, R. J. (2004). 50th Anniversary Article: The Evolution of Research on Information Systems: A Fiftieth-Year Survey of the Literature in Management Science. *Management Science*, *50*(3), 281–298. doi:10.1287/mnsc.1040.0206

Bawden, D. (2008). Origins and Concepts of Digital Literacy. In C. Lankshear & M. Knobel (Eds.), *Digital Literacies: Concepts, Policies, and Practices* (pp. 17–32). New York: Peter Lang.

Beir, J. (2000). The Digital Workplace. *VARbusiness*, *16*(16), 40–40.

Belshaw, D. (2012). *What is 'Digital Literacy'? A Pragmatic Investigation.* Unpublished doctoral dissertation, Durham University, Durham.

Benson, A. D., Johnson, S. D., & Kuchinke, K. P. (2002). The use of Technology in the Digital Workplace: A Framework for Human Resource Development. *Advances in Developing Human Resources*, *4*(4), 392–404. doi:10.1177/152342202237518

Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *Management Information Systems Quarterly*, *25*(3), 351–370. doi:10.2307/3250921

Bourdon, I., & Ollet-Haudebert, S. (2009). Towards an Understanding of Knowledge Management Systems - UTAUT Revisited. In K.E. Kendall, & U. Varshney (Eds.), *15th Americas Conference on Information Systems*, San Francisco, CA, August 6-9. Atlanta, GA: Association for Information Systems.

Briggs, C., & Makice, K. (2012). *Digital Fluency: Building Success in the Digital Age*. Bloomington, IN: SociaLens.

Brown, S. A., Dennis, A. R., & Venkatesh, V. (2010). Predicting Collaboration Technology use: Integrating Technology Adoption and Collaboration Research. *Journal of Management Information Systems*, *27*(2), 9–54. doi:10.2753/MIS0742-1222270201

Cain, M. W., Austin, T., & Gotta, M. (2014). *Hype Cycle for Digital Workplace*. Stamford, Connecticut: Gartner, Inc.

Calvani, A., Cartelli, A., Fini, A., & Ranieri, M. (2008). Models and Instruments for Assessing Digital Competence at School. *Journal of E-Learning and Knowledge Society*, *4*(3), 183–193.

Calvani, A., Fini, A., & Ranieri, M. (2009). Assessing Digital Competence in Secondary Education. Issues, Models and Instruments. In M. Leaning (Ed.), *Issues in Information and Media Literacy* (Vol. 2, pp. 153–172). Santa Rosa, CA: Informing Science Press.

Cascio, W. F. (2014). Looking Back, Looking Forward: Technology in the Workplace. In M. D. Coovert & L. Foster Thompson (Eds.), *The Psychology of Workplace Technology* (pp. 307–313). New York: Routledge.

Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, *3*(1), 349–375. doi:10.1146/annurev-orgpsych-041015-062352

Chan, F. K., Thong, J. Y., Venkatesh, V., Brown, S. A., Hu, P. J., & Tam, K. Y. (2010). Modeling Citizen Satisfaction with Mandatory Adoption of an e-Government Technology. *Journal of the Association for Information Systems*, *11*(10), 519–549. doi:10.17705/1jais.00239

Chang, I., Hwang, H., Hung, W., & Li, Y. (2007). Physicians' Acceptance of Pharmacokinetics-Based Clinical Decision Support Systems. *Expert Systems with Applications*, *33*(2), 296–303. doi:10.1016/j.eswa.2006.05.001

Chinien, C., & Boutin, F. (2011). *Defining Essential Digital Skills in the Canadian Workplace: Final Report for Human Resources and Skills Development Canada*. Retrieved from http://en.copian.ca/library/research/digi_es_can_workplace/digi_es_can_workplace.pdf

Chiu, C., & Wang, E. T. (2008). Understanding Web-Based Learning Continuance Intention: The Role of Subjective Task Value. *Information & Management*, *45*(3), 194–201. doi:10.1016/j.im.2008.02.003

Ciganek, A. P., Mao, E., & Srite, M. (2010). Organizational Culture for Knowledge Management Systems: A Study of Corporate Users. *Ubiquitous Developments in Knowledge Management: Integrations and Trends*, *4*(1), 52–67. doi:10.4018/978-1-60566-954-0.ch004

Coakes, E., Amar, A. D., & Granados, M. L. (2013). Success or Failure in Knowledge Management Systems: A Universal Issue. In *International Working Conference on Transfer and Diffusion of IT* (pp. 39-56). Springer. doi:10.1007/978-3-642-38862-0_3

Colbert, A., Yee, N., & George, G. (2016). The Digital Workforce and the Workplace of the Future. *Academy of Management Journal*, *59*(3), 731–739. doi:10.5465/amj.2016.4003

Collard, A., De Smedt, T., Dufrasne, M., Fastrez, P., Ligurgo, V., Patriarche, G., & Philippette, T. (2017). Digital Media Literacy in the Workplace: A Model Combining Compliance and Inventivity. *Italian Journal of Sociology of Education*, *9*(1), 122–154.

Coolican, H. (2014). *Research Methods and Statistics in Psychology* (6th ed.). Hove, East Sussex: Psychology Press.

Covello, S. (2010). *A Review of Digital Literacy Assessment Instruments. Unpublished front-end analysis research*. Syracuse: Syracuse University.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of use, and User Acceptance of Information Technology. *Management Information Systems Quarterly*, *13*(3), 319–340. doi:10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, *35*(8), 982–1003. doi:10.1287/mnsc.35.8.982

Deloitte. (2014). *The Digital Workplace: Think, Share, Do*. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/us-cons-digital-workplace-and-culture.pdf

Dery, K., Sebastian, I., & Van der Meulen, N. (2017). The Digital Workplace is Key to Digital Innovation. *MIS Quarterly Executive*, *16*(2), 135–152.

Dillon, A., & Morris, M. G. (1996). User Acceptance of New Information Technology: Theories and Models. In M. Williams (Ed.), *Annual Review of Information Science and Technology* (Vol. 31, pp. 3–32). Medford, NJersey: Information Today.

Dwivedi, Y., Rana, N., Chen, H., & Williams, M. (2011). A Meta-Analysis of the Unified Theory of Acceptance and use of Technology (UTAUT). In M. Nüttgens, A. Gadatsch, K. Kautz et al. (Eds.) *IFIP International Working Conference on Governance and Sustainability in Information Systems - Managing the Transfer and Diffusion of IT*, Hamburg, Germany, September 22-24. Springer. doi:10.1007/978-3-642-24148-2_10

Eshet, Y. (2012). Thinking in the digital era: a revised model for digital literacy. *Issues in Informing Science & Information Technology*, *9*(2), 267–276. doi:10.28945/1621

Eshet-Alkalai, Y. (2004). Digital literacy: a conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, *13*(1), 93–106.

Field, A. P. (2009). *Discovering Statistics using SPSS: (and Sex and Drugs and Rock 'n' Roll)* (3rd ed.). Los Angeles: SAGE.

Gilster, P. (1997). *Digital Literacy*. New York: Wiley Computer Publishing.

Hargittai, E. (2005). Survey measures of web-oriented digital literacy. *Social Science Computer Review*, *23*(3), 371–379. doi:10.1177/0894439305275911

Harris, J., Ives, B., & Junglas, I. (2012). IT Consumerization: when gadgets turn into enterprise IT tools. *MIS Quarterly Executive*, *11*(3), 99–112.

Hobert, K. (2015). *Revive Knowledge Management with the Digital Workplace*. Stamford, Connecticut: Gartner, Inc.

House of Commons. (2016). House of Commons Science and Technology Committee. Digital Skills Crisis Second Report of the House of Commons Science and Technology Committee (HC 936; Session 2016-17). London: UK Parliament.

Jones, R. H., & Hafner, C. A. (2012). *Understanding Digital Literacies: A Practical Introduction*. Abingdon, Oxfordshire: Routledge.

Kasemsap, K. (2018). Encouraging Digital Literacy and ICT Competency in the Information Age. In M. Khosrow-Pour (Ed.), *Encyclopedia of Information Science and Technology* (4th ed., pp. 2253–2263). Hershey, Pennsylvania: IGI Global. doi:10.4018/978-1-5225-2255-3.ch196

Kiron, D., Kane, G. C., Palmer, D., Phillips, A. N., & Buckley, N. (2016). *Aligning the Organization for its Digital Future* Retrieved from http://pedrotrillo.com/wp-content/uploads/2016/01/58180-MITSMR-Deloitte-Digital-Business-2016.pdf

Kluzer, S., & Pujol Priego, L. (2018). DigComp into Action - Get Inspired, Make it Happen. In Carretero, Y., Punie, R., Vuorikari, M. Cabrera, and O'Keefe, W. (Eds.), JRC Science for Policy Report, EUR 29115 EN, Publications Office of the European Union, Luxembourg.

Köffer, S. (2015). Designing the Digital Workplace of the future–what Scholars Recommend to Practitioners. In *The 36th International Conference on Information Systems (ICIS)*, Fort Worth, Texas, December 13-16.

Lanham, R. A. (1995). Digital Literacy. *Scientific American*, *273*(3), 198–199.

Lankshear, C., & Knobel, M. (2008). Introduction. In C. Lankshear & M. Knobel (Eds.), *Digital Literacies: Concepts, Policies, and Practices* (pp. 17–32). New York: Peter Lang.

Lankshear, C. & Knobel, M. (2015). Digital Literacy and Digital Literacies: Policy, Pedagogy and Research Considerations for Education. *Nordic Journal of Digital Literacy 10*(Jubileumsnummer), 8-20.

Leu, D. J., McVerry, J. G., O'Byrne, W. I., Zawilinski, L., Castek, J., & Hartman, D. K. (2009). The New Literacies of Online Reading Comprehension and the Irony of no Child Left Behind. In L. Mandel Morrow, R. Rueda, & D. Lapp (Eds.), *Handbook of Research on Literacy and Diversity* (pp. 173–194). New York: Guilford Press.

Loose, M., Weeger, A., & Gewald, H. (2013). BYOD – the Next Big Thing in Recruiting? Examining the Determinants of BYOD Service Adoption Behavior from the Perspective of Future Employees. In J. P., Shim, Hwang, Y., and Petter, S. (Eds.) *19th Americas Conference on Information Systems.* held 15-17 2013 at Chicago, Illinois. Atlanta, Georgia: Association for Information Systems.

Markets & Markets. (2017). *Workplace Transformation Market Worth 18.06 Billion USD by 2021*. Retrieved from http://www.marketsandmarkets.com/PressReleases/digital-workplace-transformation-service.asp

Marks, A., Briken, K., Chillas, S., & Krzywdzinski, M. (2017). *The New Digital Workplace: How New Technologies Revolutionise Work*. London: Palgrave.

Martin, A., & Grudziecki, J. (2006). DigEuLit: Concepts and Tools for Digital Literacy Development. *Innovation in Teaching and Learning in Information and Computer Sciences*, *5*(4), 1–19.

McAfee, A. P. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *MIT Sloan Management Review*, *47*(3), 21–28.

McConnell, J. (2011). *The Digital Workplace, a 10-Year Old Term with New Life*. Retrieved from http://www.netjmc.com/digital-workplace/intranet-digital-workplace-or-workplace-web-or-intranet

Miller, M. P., & Marsh, M. E. (2014). *The Digital Renaissance of Work: Delivering Digital Workplaces Fit for the Future*. London: Gower Publishing.

Miltgen, C. L., Popovič, A., & Oliveira, T. (2013). Determinants of End-User Acceptance of Biometrics: Integrating the "Big 3" of Technology Acceptance with Privacy Context. *Decision Support Systems*, *56*, 103–114. doi:10.1016/j.dss.2013.05.010

Mitrovic, Z. (2010). Positioning e-Skills within an Organisation: An Information Systems Management Viewpoint. *South African Journal of Information Management*, *12*(1), 1–7. doi:10.4102/sajim.v12i1.427

Mohammadyari, S., & Singh, H. (2015). Understanding the Effect of e-Learning on Individual Performance: The Role of Digital Literacy. *Computers & Education*, *82*, 11–25. doi:10.1016/j.compedu.2014.10.025

Ng, W. (2012a). *Education in a Competitive and Globalizing World: Empowering Scientific Literacy through Digital Literacy and Multiliteracies*. Hauppauge: Nova Science Publishers.

Ng, W. (2012b). Can we Teach Digital Natives Digital Literacy? *Computers & Education*, *59*(3), 1065–1078. doi:10.1016/j.compedu.2012.04.016

Oliveira, T., Faria, M., Thomas, M. A., & Popovič, A. (2014). Extending the Understanding of Mobile Banking Adoption: When UTAUT Meets TTF and ITM. *International Journal of Information Management*, *34*(5), 689–703. doi:10.1016/j.ijinfomgt.2014.06.004

Osterman, M. D. (2012). Digital literacy: Definition, theoretical framework, and competencies. in Plakhotnik, M. S., Nielsen, S. M., and Pane, D. M. (eds.), *Proceedings of the 11th Annual College of Education & GSN Research Conference*. held 28 April 2012 at Florida International University. Miami: Florida International University, 135-141.

Oxford Economics. (2017). *Building the Digital Workplace: What Comes Next in the Mobile Revolution*. Retrieved from http://www.oxfordeconomics.com/my-oxford/projects/365465

Rogers, E. (1962). Diffusion and Innovation. *The Journal of Consumer Research*, *2*, 290–301. doi:10.1086/208642

Sarabadani, J., Jafarzadeh, H., & ShamiZanjani, M. (2017). Towards understanding the determinants of employees' e-learning adoption in workplace: a unified theory of acceptance and use of technology (UTAUT) view. *International Journal of Enterprise Information Systems*, *13*(1), 38–49. doi:10.4018/IJEIS.2017010103

Schallenmueller, S. (2015). Smart Workplace Technology Buzz. In J. E. Lee (Ed.), *The Impact of ICT on Work* (pp. 127–150). Switzerland: Springer.

Schmidl, J., Slavtchev, V., Wittges, H., & Krcmar, H. (2011). *Knowledge Management Success or Failure - What Determines the Performance of a KM-Initiative?* (pp. 161–169). Wissensmanagement.

Senter, K. Y., & McClelland, A. (2015). Top ten workplace skills for future organizations. *International Journal of Business Research and Management*, *6*(2), 20–32.

Sharma, R., & Mishra, R. (2014). A review of evolution of theories and models of technology adoption. *Indore Management Journal*, *6*(2), 17–29.

Soule, D. L., Puram, A. D., Westerman, G. F., & Bonnet, D. (2016). *Becoming a Digital Organization: The Journey to Digital Dexterity*. Retrieved from https://ssrn.com/abstract=2697688

Sun, Y., Liu, L., Peng, X., Dong, Y., & Barnes, S. J. (2014). Understanding Chinese users' continuance intention toward online social networks: an integrative theoretical model. *Electronic Markets*, *24*(1), 57–66. doi:10.1007/s12525-013-0131-9

Tabachnick, B. G., & Fidell, L. S. (2014). *Using Multivariate Statistics* (6th ed.). Harlow, Essex: Pearson.

Triandis, H. (1977). *Interpersonal Behaviour*. Monterey, California: Brooks/Cole.

Van Deursen, A. J. A. M., Helsper, E. J., & Eynon, R. (2014). *Measuring Digital Skills. from Digital Skills to Tangible Outcomes Project Report*. Retrieved from http://eprints.lse.ac.uk/61807/1/__lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_Helsper,%20E_Helsper_Tangible%20outcomes_2015.pdf

Van Deursen, A. J. A. M., Helsper, E. J., & Eynon, R. (2016). Development and validation of the internet skills scale (ISS). *Information Communication and Society*, *19*(6), 804–823. doi:10.1080/1369118X.2015.1078834

Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M. (2012). *Ctrl Alt Delete: Lost Productivity due to IT Problems and Inadequate Computer Skills in the Workplace*. Retrieved from http://www.alexandervandeursen.nl/Joomla/Articles/Reports/2012%20-%20CTRL_ALT_DEL_ENG.pdf

Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & Peters, O. (2012). Proposing a Survey Instrument for Measuring Operational, Formal, Information, and Strategic Internet Skills. *International Journal of Human-Computer Interaction*, *28*(12), 827–837. doi:10.1080/10447318.2012.670086

Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A., & De Haan, J. (2017). The Relation between 21st-Century Skills and Digital Skills: A Systematic Literature Review. *Computers in Human Behavior*, *72*, 577–588. doi:10.1016/j.chb.2017.03.010

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*(2), 186–204. doi:10.1287/mnsc.46.2.186.11926

Venkatesh, V., Davis, F. D., & Morris, M. G. (2007). Dead or alive? the development, trajectory and future of technology adoption research. *Journal of the Association for Information Systems*, *8*(4), 267–286. doi:10.17705/1jais.00120

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *Management Information Systems Quarterly*, *24*(1), 115–139. doi:10.2307/3250981

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *Management Information Systems Quarterly*, *27*(3), 425–478. doi:10.2307/30036540

Venkatesh, V., Thong, J. Y., & Xu, X. (2016). Unified theory of acceptance and use of technology: a synthesis and the road ahead. *Journal of the Association for Information Systems*, *17*(5), 328–376. doi:10.17705/1jais.00428

Wang, T., Jung, C., Kang, M., & Chung, Y. (2014). Exploring determinants of adoption intentions towards enterprise 2.0 applications: an empirical study. *Behaviour & Information Technology*, *33*(10), 1048–1064. doi :10.1080/0144929X.2013.781221

White, M. (2012). Digital workplaces: vision and reality. *Business Information Review*, *29*(4), 205–214. doi:10.1177/0266382112470412

Wiggins, B. (2015). The digital renaissance of work. p. miller, e. marsh. Gower Publishing, Farnham. 216p., Price £20.00. *International Journal of Information Management*, *35*(5), 606–608. doi:10.1016/j.ijinfomgt.2015.06.002

Wood, C. P., Giles, D., & Percy, C. (2009). *Your Psychology Project Handbook: Becoming a Researcher* (2nd ed.). Harlow, Essex: Pearson.

Yoo, S. J., Han, S., & Huang, W. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: a case from South Korea. *Computers in Human Behavior*, *28*(3), 942–950. doi:10.1016/j.chb.2011.12.015

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